Time-resolved core level photoemission: Surface photovoltage dynamics at the SiO_2/Si(100) interface

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We present a time-resolved surface photovoltage study with combined Laser synchrotron radiation (SR) in a pump-probe scheme which has been performed at the MBI undulator beamline at BESSY with synchronized Laser pulses from a specially designed Nd:YVO4 laser system (both operating at 1.25 MHz). By sum frequency generation the width of the laser SR cross correlation could be determined to about 60 ps, the SR pulse width in the single bunch mode. Time-resolved Si 2p photoemission upon laser excitation for different SiO_2/Si(100) interfaces shows SPV shifts which decay on different time-scales.
Future two-color two-photon photoemission (2C-2PPE) experiments will focus on the excited state dynamics in well-characterized OLED (organic light emitting diode materials) thin films, e.g. in adsorbed para-sexiphenyl, and the coupling to metal surfaces. The essentials of the experiment will be outlined.